



Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

DR. GAIL BROWN EARNS AIR FORCE BASIC RESEARCH AWARD FOR SUPERLATTICE MATERIALS RESEARCH



Dr. Gail J. Brown's research resulted in significant advancements in the fundamental physics, design, parameters, and growth processes for Type-II superlattice materials. Her achievements and selection for the Air Force Basic Research Award advance the Materials and Manufacturing Directorate's reputation as a world leader in materials research and development and recognize AFRL's efforts in supporting Air Force operational requirements. Dr. Brown's work supporting the warfighter could lead to several millions of dollars in savings for the Air Force and Department of Defense.



Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

Dr. Gail J. Brown, a research leader and principal research physicist in the directorate's Survivability and Sensor Materials Division, Sensor Materials Branch, recently earned the Air Force Basic Research Award for cutting-edge research on superlattice materials for next-generation infrared sensing. The award also recognizes Dr. Brown for exemplary leadership in coordinating the research project from computational modeling and growth of the superlattice materials to initial device testing of the new materials' system.

Background

A number of Air Force weapon systems incorporate infrared (IR) detector arrays operating in the long and very long wave infrared (VLWIR) wavelengths. For space-based sensors, the issues of sensor system weight, power, and reliability are critical factors as well as the increasing demands for more capability and higher performance.

Dr. Brown specializes in the development of materials for improving the performance of sensors on advanced IR systems. The international IR technical community recognizes Dr. Brown as a leading expert and advocate for this science and its application to Air Force needs in space. She performed and led the defining research in the science of semiconductor superlattice materials for IR sensing, with a special focus on application to space-based VLWIR sensors.

Dr. Brown's research concentrates on the design, assessment, and demonstration of new semiconducting materials capable of out performing industry standards. Her pioneering research on semiconductor superlattices helped make them available for Air Force IR detector applications. Dr. Brown led a team of researchers, composed of government, university, and industry researchers, to cover every aspect of superlattice materials research from computational modeling to atomic layer-by-layer growth of the material to electrical and optical characterization.

The comprehensive, fundamental research accomplished by Dr. Brown and her colleagues demonstrated the viability of superlattices and showed that these advanced materials can vastly improve IR-sensitive semiconductor performance. In vital Air Force systems, sensors made with these materials offer greatly improved performance, high uniformity over large areas, and wavelength tunability, while significantly improving satellite launch costs, operational reliability, and life-cycle costs.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-ML-13)